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Filed: June 20, 2003

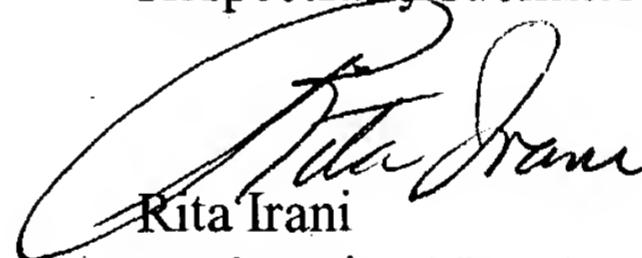
For: A SYRINGE PUMP

TO: Commissioner for Patents  
P.O. Box 1450  
Alexandria, VA 22313-1450

**STATEMENT OF ACCURACY OF TRANSLATION**  
**UNDER 37 C.F.R. § 1.52(d)**

Applicants verify that the English language translation accompanying this statement is an accurate translation of the German utility patent application 20209581.9, filed on June 20, 2002, a certified copy of which also accompanies this statement.

Respectfully submitted,



Rita Irani

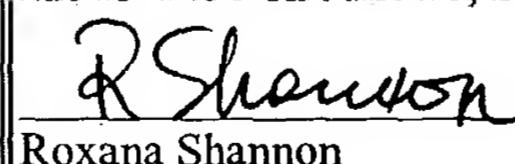
Registration No.: 31,028

Date: June 20, 2003

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Roxana Shannon

## A syringe pump

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The invention refers to a syringe pump comprising a housing having a syringe trough for the syringe to be placed therein, an operating panel and a drive head for moving the syringe plunger of the syringe, the drive head being movable linearly with respect to the housing.

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In modern intensive-care medicine large numbers of infusion apparatus find increasing use. A single intensive-care site can comprise up to twenty infusion pumps. This requires a compact design of the infusion pumps. Therefore, they should be designed small in size.

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It is the object of the invention to provide a syringe pump which, despite its small size, allows for a good readability of the syringes inserted therein.

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According to the invention, this object is solved with the features of claim 1. According to that, a swivelling lid covering at least a part of the syringe trough comprises a magnifying means for a magnified representation of the syringe surface, which optically magnifies the syringe surface of syringes of different sizes whose diameters differ by at least the factor 2.

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A part of the lid is designed as a magnifying means so as to provide the user a magnified representation of the relevant portion of the syringe. Such an optical magnification is especially useful if the syringe pump is suitable for syringes of different formats. With small syringes, the scale and the numbers are necessarily small in size. In this case, the magnifying means brings the surface of the syringe lying deep down in the syringe trough to the eye of the viewer in a magnified form. Thereby, it is avoided that the user first has to visually search for a small syringe and then has to undergo the trouble

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of reading a minuscule scale. Even if the viewer is further away and the viewing angle is unfavorable, a small syringe can be read easily.

In addition, the lid can include a lighting conducting light into the syringe trough.

5 As an alternative, the lighting device can be provided at the syringe trough. The assistance provided by a lighting is particularly useful in darkened environments. Moreover, lighting can also draw attention to special conditions of an apparatus, e.g. to indicate an alarm. To this end, special light colors may also be activated.

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The following is a detailed description of an embodiment of the invention with reference to the drawings.

In the figures:

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Fig. 1 is a perspective view of the syringe pump with the lid closed,

Fig. 2 illustrates the syringe pump with the lid opened,

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Fig. 3 is a perspective view of the lid, and

Fig. 4 is a sectional view for illustrating the suitability of the syringe pump for different syringe sizes.

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The syringe pump comprises a housing 10 in the form of a flat box. At the front side of the housing 10, the horizontal syringe trough 14 is located, into which a syringe 15 may be placed. The syringe 15 has a syringe barrel 16 and a plunger therein, connected to a plunger rod 17. A piston plate 18 is arranged at the end of the piston rod 17. The proximal end of the syringe barrel 16 is provided with syringe lugs 20 set against a syringe bearing 21 of the housing to secure the syringe against axial displacement.

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The housing 10 is further provided with a syringe bracket 22 adapted to be manually pulled out to the front and having a handle 23 for that purpose. The syringe bracket 22 is drawn towards the syringe 15 by a spring, whereby it pushes the syringe against the syringe trough 14. The position of the syringe bracket 22 is detected and electronically evaluated to thereby determine the syringe size. The syringe bracket 22 has a blade 24 partially extending over the syringe lug 20, which may engage the piston rod 17 to act as a piston brake. The blade 24 can be moved in a controlled manner.

10 To move the syringe piston relative to the syringe barrel 16, the housing 10 is provided with a drive rod 25 that can be extended from a front end face of the housing and has a drive head 26 at its end. The drive head 26 includes a gripping device that grips and holds the piston plate 18. By a controlled movement of the drive rod 25, the piston rod 17 is advanced to expel the 15 contents of the syringe 15. An infusion line 27 leading to a patient is connected to the distal end of the syringe 15.

20 The syringe trough 14 extends along the front side of the housing 10 between one end wall 28 and an intermediate wall 29. The syringe trough 14 is closed with a lid 30 hinged to the lower front edge of the housing by hinges 31. In the closed state, the lid 30 abuts on the end wall 28, the intermediate wall 29 and the top wall 13 of the housing.

25 As illustrated in Figure 1, the front face of the lid 30 includes the operating panel 32 comprising various keys for operation by the user. Further, the front face of the lid comprises a display device 33. The operating panel 32 and the display device 33 are electrically connected to a processor within the housing.

30 The operating panel 32 and the display device 33 extend over only a part of the height of the lid 30. The upper part of the lid 30 is provided with a transparent window 34. The window 34 contains a cylinder lens forming a

English language translation of:

magnifying device 35. With the lid 30 closed, the magnifying device 35 magnifies the syringe and especially a scale 36 on the syringe. The focal length of the magnifying device is greater than the distance  $a$  between an object and the magnifying device for the smallest syringe usable.

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The lid 30 includes a lighting device 40 which in the present case has three light sources emitting light towards the syringe 15. The lighting device may serve, on the one hand, to illuminate the syringe, but, in case of a syringe alarm, may also serve as a signaling means to identify the syringe pump causing 10 the alarm.

Figure 4 illustrates that syringes of different sizes can be placed into the syringe trough 14, being orientated such that they can be viewed through the magnifying device 35. 15a defines the circumference of a large syringe, whereas 15 15 b defines the circumference of a small syringe.

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## Claims

1. A syringe pump comprising a housing (10) with a syringe trough (14) for a syringe (15) to be placed therein, a drive head (26) for moving the syringe plunger of the syringe, the drive head being movable linearly with respect to the housing (10), and an operating panel (32),

characterized in that

a swivelling lid (30) covering at least a part of the syringe trough (14) comprises a magnifying means (35) for a magnified representation of the syringe surface, which optically magnifies the syringe surface of syringes (15a, 15b) of different sizes whose diameters differ by at least the factor 2.

2. The syringe pump of claim 1, wherein the magnifying device (35) comprises an elongate cylinder lens.
3. The syringe pump of claim 1 or 2, wherein the lid (30) or the syringe trough (14) comprises a lighting device (40) for illuminating the syringe (15) in the syringe trough (14).
4. The syringe pump of one of claims 1-3, wherein the lid (30) includes an operating panel (32) and a display device (33).

English language translation of:

## Abstract

### A syringe pump

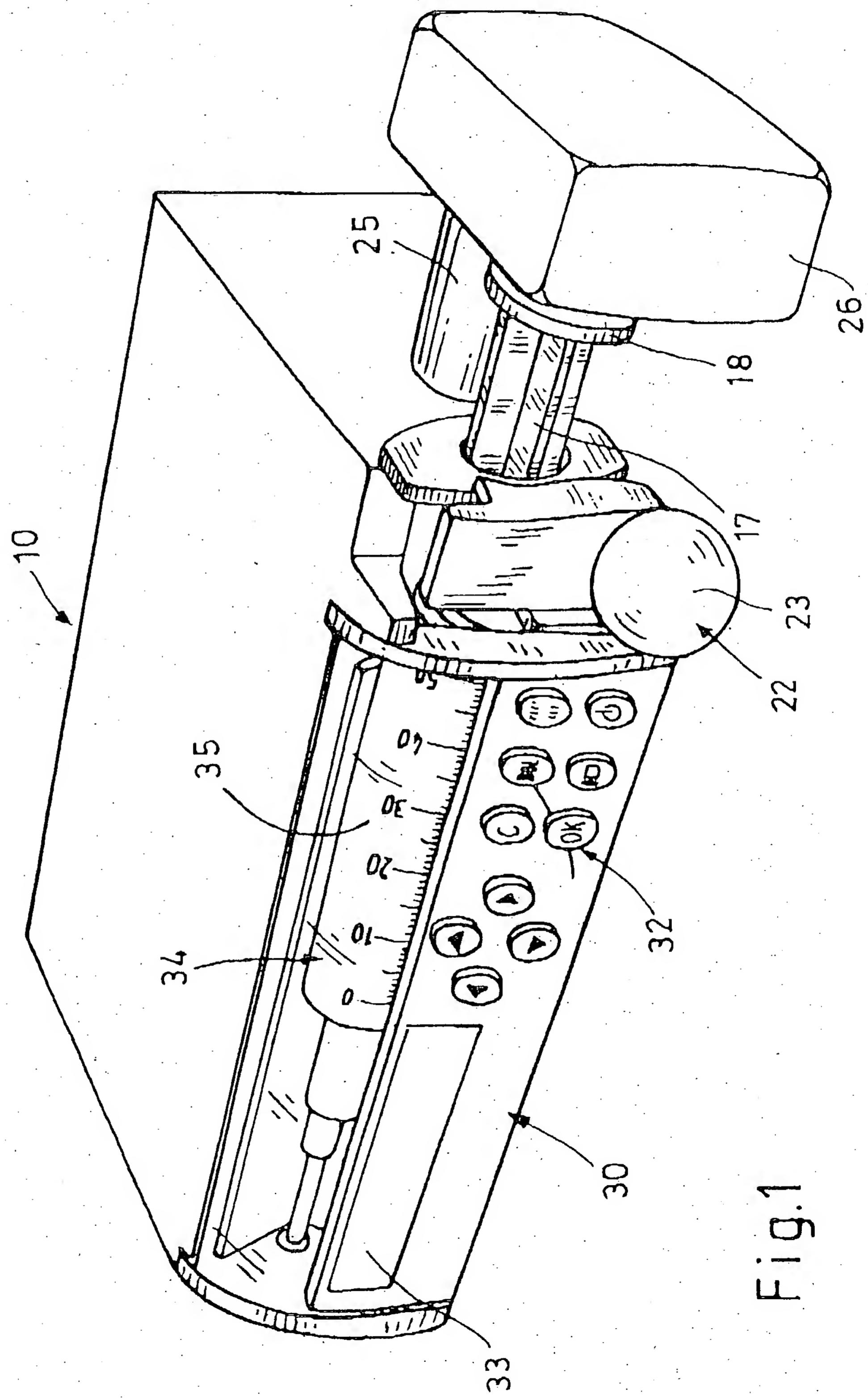
The syringe pump comprises a housing (10). The operating panel (32) is situated on a swivelling lid (30) on the front side of the housing (10). The lid (30) further comprises a window (34) with a magnifying device (35) through which the user can view the syringe. The invention allows for a miniaturization of the syringe pump in a highly densified modular system. The lid (30) may further include a lighting means for illuminating the syringe.

(Fig. 1)

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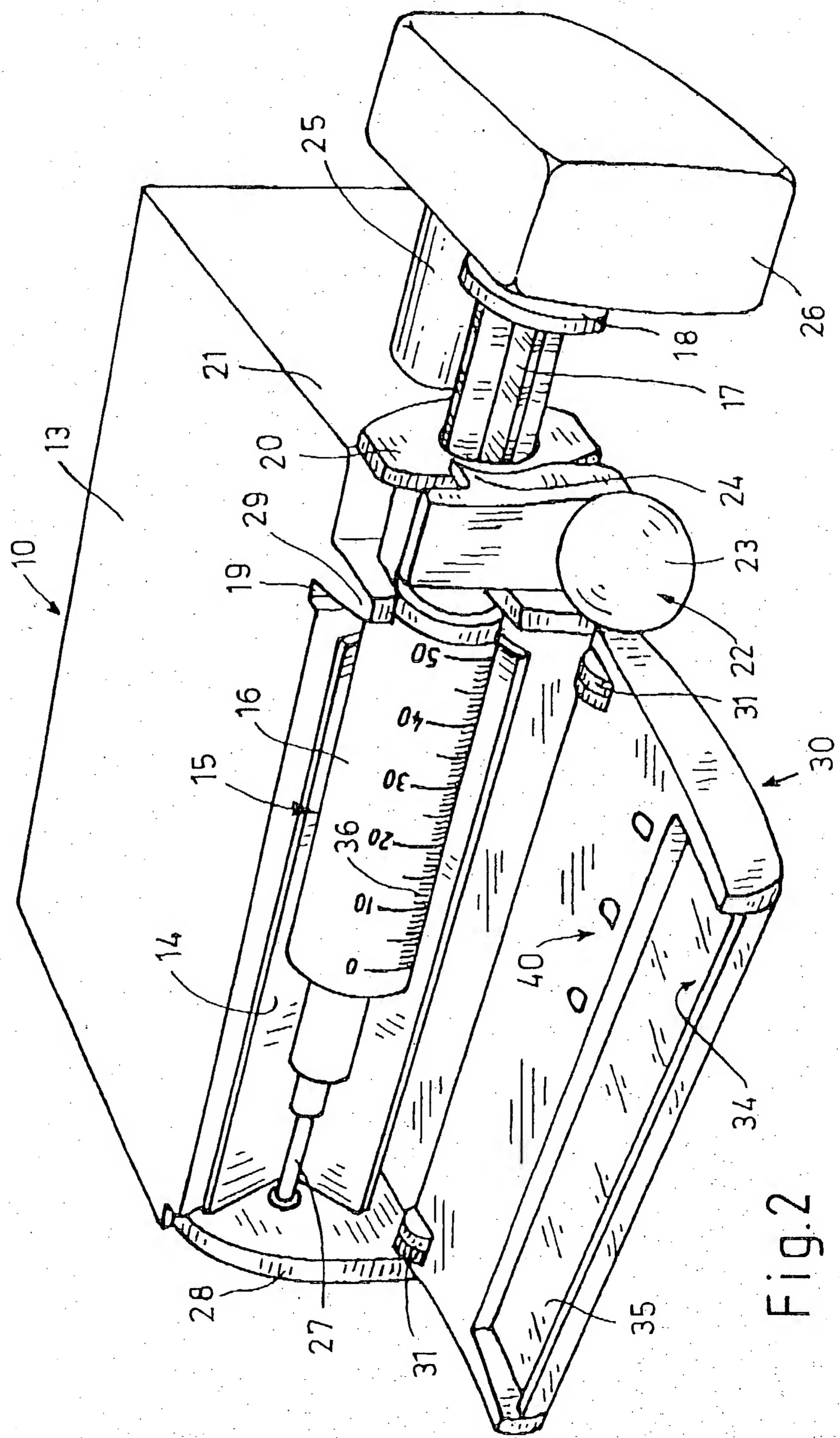


Fig. 2

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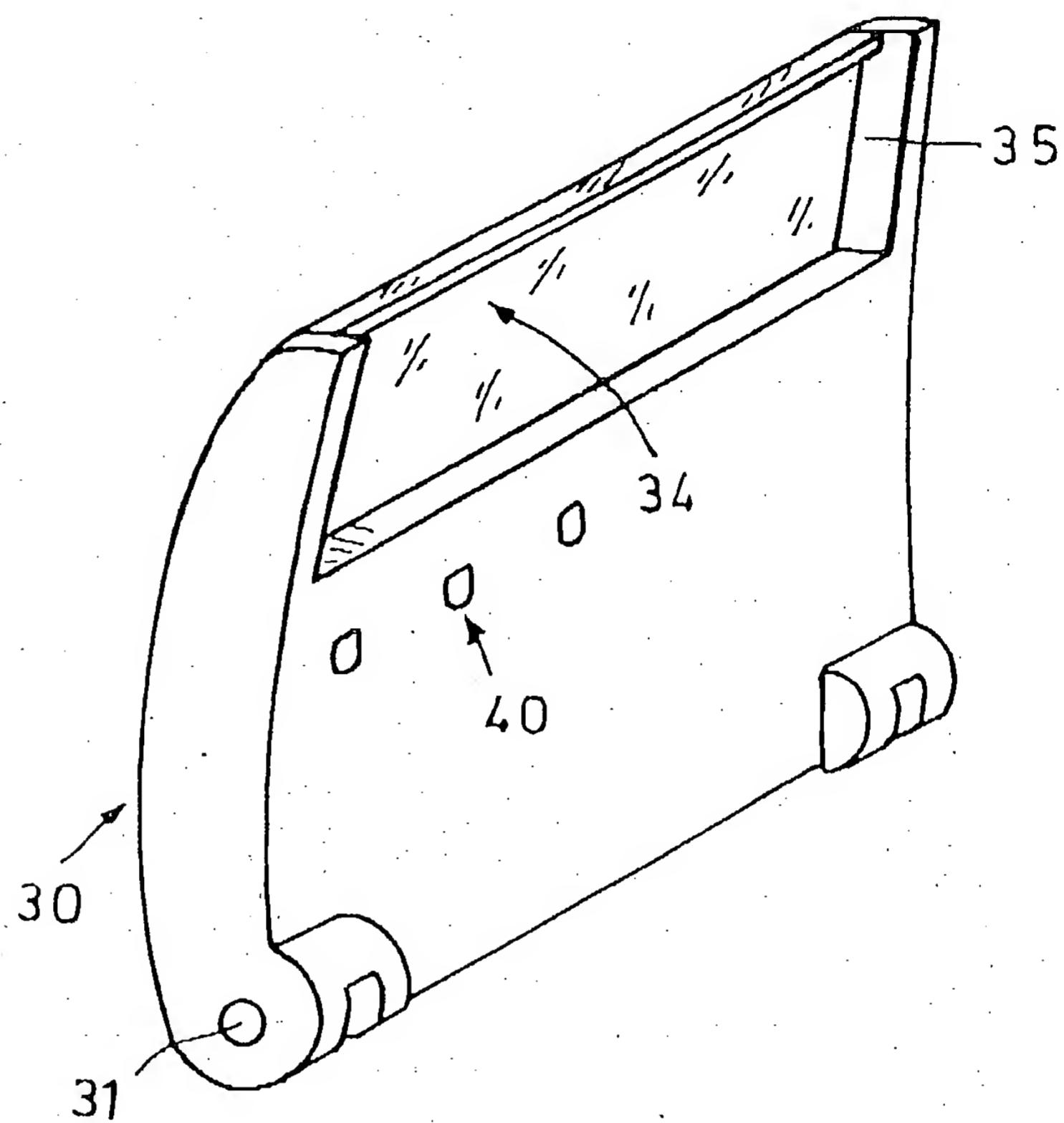


Fig. 3

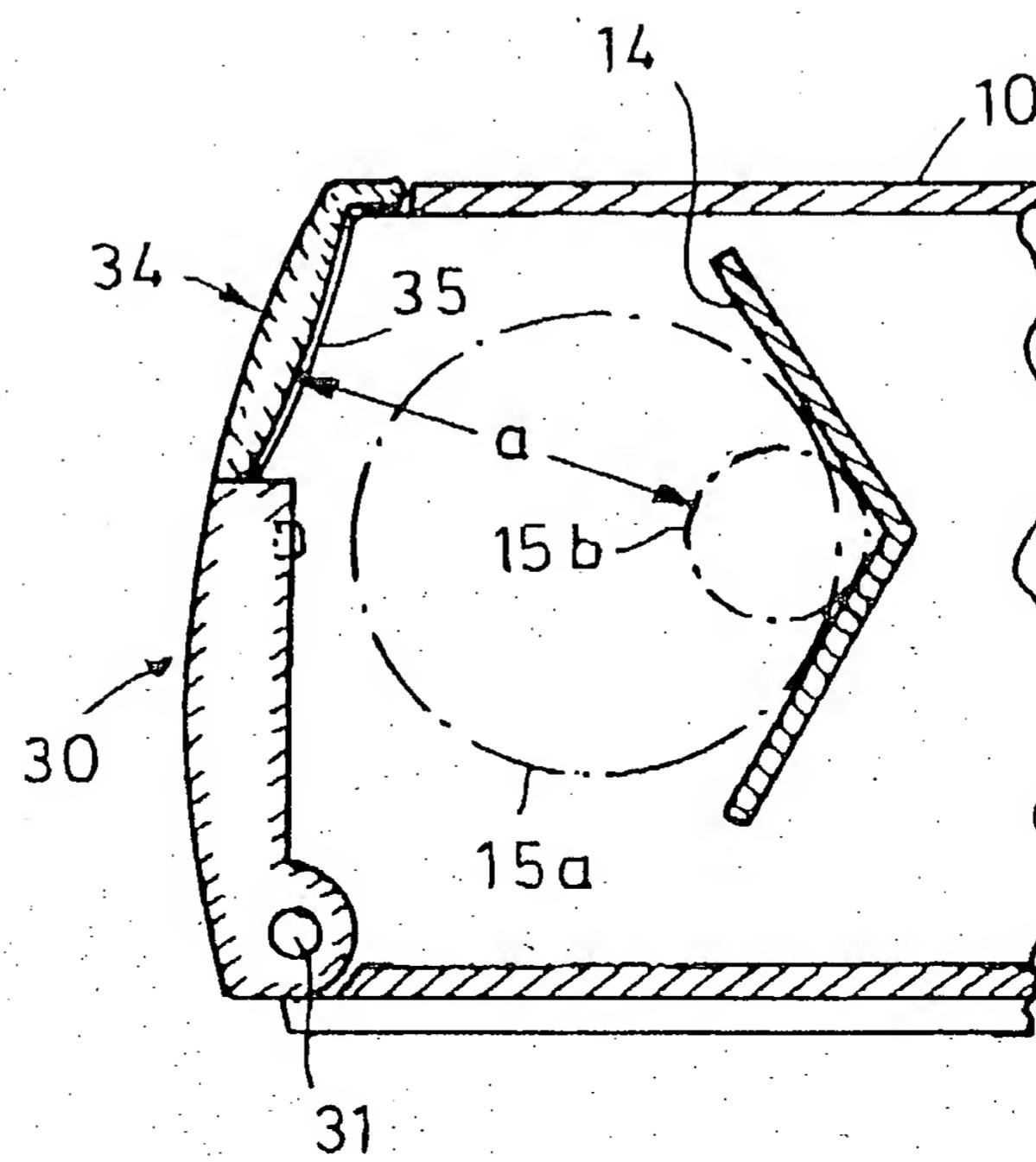


Fig. 4